

#### **IV. Geoengineering Resolution**

##### **The Fort Lauderdale Clean Sky Ordinance**

**AN ORDINANCE TO BE ADDED INTO TITLE xxx OF THE FORT LAUDERDALE MUNICIPAL CODE, RELATING TO ENVIRONMENTAL PROTECTION, INTRODUCED AND PROPOSED IN ACCORDANCE WITH SECTION xxx OF THE MUNICIPAL CODE IN THE CITY OF FORT LAUDERDALE**

**BE IT ORDAINED BY THE PEOPLE OF THE CITY OF FORT LAUDERDALE:**

**Title.** The rules and regulations of this Article shall be known as the “**FORT LAUDERDALE CLEAN SKY ORDINANCE.**”

**Authority.** The rules herein are established pursuant to the provisions of Section xxx of the Fort Lauderdale Municipal Code, and in accordance with Florida Constitution provisions, specifically Article xxx, Section xxx on Conservation and Development of Resources<sup>iv</sup> and Article xxx, Section xx on Environmental Rights.

**Purpose.** The preservation, protection, and conservation of the natural environment in the City of Fort Lauderdale, including but not limited to water, soil and air quality, is one of the greatest concerns of its government and its people. Pollution and contamination of the land, air, and water supply is unacceptable because of the adverse effects on the health, safety and welfare of the people of the City of Fort Lauderdale and the natural environment, especially when the effects and reversibility are unknown.

Therefore, it is the purpose and intent of this ordinance to regulate the disbursement of aerosols, chemicals or any particulate matter into the skies above or around Fort Lauderdale, other than those byproducts and standard emissions of industry, agriculture, commerce and transportation that are *both* properly disclosed and approved by applicable governmental agencies. There is currently inadequate research on the collateral effects such disbursements may have on the health of the people and the environment.

Therefore, the purpose of this law is to require any person, firm, corporation, agency, or entity that intends on discharging or disbursing such aerosols, chemicals or any particulate matter, to file a complete Environmental Impact Statement with the City of Fort Lauderdale, in a form prescribed by the City, and obtain written and informed approval from the City prior to taking such action.

##### **Findings.**

A. The people of the City of Fort Lauderdale recognize that various organizations, both governmental and nongovernmental, propose the global disbursement of aerosols and other particulates into the atmosphere for the stated goal of countering the negative effects of global warming – a process labeled

with various terms, including but not limited to: “geoengineering,” “climate engineering,” “climate remediation,” and/or “solar radiation management.”<sup>vi</sup>

B. The people of the City of Fort Lauderdale find that there is increasingly more information, studies, and reports indicating that such geoengineering efforts have been proposed and may be currently occurring.<sup>vii</sup>

C. The people of the City of Fort Lauderdale further find that studies show that disbursements from stratospheric aerosol geoengineering and other such programs may contain potentially harmful substances with many known and unknown health and environmental consequences, which may contaminate the air, water, soil and people of Fort Lauderdale.<sup>viii</sup>

D. The people of the City of Fort Lauderdale conclude that any such program that may result in potentially adverse health and environmental implications must obtain the informed consent of the people of the City of Fort Lauderdale. Such informed consent must be legally obtained by filing an Environmental Impact Statement with, and receiving approval from, the Fort Lauderdale City Commission.

**Proposed Law:**

**A. Prohibited Activities:**

Except as described under subsection B, it is unlawful for any person, firm, corporation, agency, or entity to:

- 1) Use any type of aircraft or other self-propelled or buoyant airborne object, or any other land-based, air-based, or water-based device or vehicle to disburse aerosols, chemicals, or any particulate matter into the airspace above or around the City of Fort Lauderdale that may enter the breathing atmosphere, the rain, or the soils of the City of Fort Lauderdale; or
- 2) Engage in any act of geoengineering, climate engineering, or any other act related to the climate manipulation of the City of Fort Lauderdale; or
- 3) Engage in any activity that is intended to alter the weather or the sunlight of the City of Fort Lauderdale.

**B. Exceptions:**

- 1) Nothing in this chapter prohibits any act stated in Subsection A, so long as the person, firm, corporation, agency or entity has first submitted an Environmental Impact Statement to the Fort Lauderdale City Commission, in a form prescribed by the City Commission or its designee, and has received written informed approval from the Fort Lauderdale City Commission; and
- 2) Nothing in this chapter prohibits any act stated in Subsection A, so long as the disbursements are the byproducts and emissions of industry, agriculture, commerce and transportation that are *both* properly disclosed and approved by applicable governmental agencies.

**Form Established.** The City Commission is hereby authorized, empowered, and directed to develop an Environmental Impact Statement Form to be used by persons, firms, corporations, agencies or entities wishing to perform any disbursements, climate altering activities, weather modification, or geoengineering, as discussed in this chapter.

**Penalty.** Any person, firm, corporation, agency or entity who knowingly violates this Title shall be fined not more than ten thousand dollars (\$10,000.00) or by imprisonment not exceeding one year, or by both. The continuance of any such violation shall be deemed a new violation for each day of such continuance. In addition, the City Attorney may institute an action to prevent, restrain, correct, or abate any violation of this Title and seek such relief by way of injunction or otherwise, as may be proper under the facts and circumstances of the case, in order to fully effectuate the purposes of this Title.

**Administrative rules.** The Director of Environmental Management may adopt administrative rules to implement this chapter, pursuant to Chapter xxx, Florida Revised Statutes.

**Administrative enforcement.** In lieu of or in addition to, enforcement by criminal prosecution, the Director of Environmental Management may enforce this chapter pursuant to section xxxx of this code, relating to administrative enforcement.

**Severability.** If any portion of this code, or its application to any person or circumstance, shall be held unconstitutional or invalid, the remainder of this code and the application of such portion to other persons or circumstances shall not be affected thereby.

**Effective Date.** This ordinance shall take effect 10 days after recorded with the Fort Lauderdale County Clerk.

## **REFERENCES**

<sup>i</sup> Broward County, Code of Ordinances, Title xxxx – *Environmental Protection*.

<sup>ii</sup> **“Section 4-2. Introduction, Consideration and Passage of Ordinances and Resolutions.**

1. Every proposed ordinance shall be initiated as a bill and shall be passed after two readings on separate days.
2. Except as otherwise provided by law, resolutions may be adopted on one reading.
3. Upon the request of three members of the council, a public hearing shall be held on any proposed ordinance or resolution.
4. Digests of all bills which pass first reading and the votes thereon shall be published once in a newspaper of general circulation in the county at least three (3) days before final reading.
5. After passage all bills shall be promptly advertised once by title only in a newspaper of general circulation in the county, with the ayes and noes.
6. Should the council find by a two-thirds vote of its entire membership the existence of an emergency threatening life, health, or property due to a public calamity, the council may waive

all of the requirements of this section pertaining to procedure, except all votes shall be recorded. Every emergency ordinance, including any amendments made therein after its adoption, shall automatically stand repealed on the ninety-first (91st) day following the date on which it became effective. The council may prescribe by rule procedures for emergency meetings of its membership to be held by conference telephone or similar communication equipment in the event of public calamity.

7. Resolutions authorizing proceedings in eminent domain shall be adopted as provided by law.
8. Bills and resolutions may be passed on first reading by council members and passed on second reading by their successors.”

iii **“Section 4-5. Codification of Ordinances.**

1. The council shall cause any codification of all of the ordinances of the county heretofore prepared and published to be revised and updated at least biennially.
2. Prior to passage of a bill providing for the adoption of a uniform code not less than three copies of the uniform code shall be filed for use and examination by the public in the office of the county clerk at least sixty (60) days prior to passage thereof.”

iv “For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect the City of Fort Lauderdale’s natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State.”

v “Each person has the right to a clean and healthful environment, as defined by laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources. Any person may enforce this right against any party, public or private, through appropriate legal proceedings, subject to reasonable limitations and regulation as provided by law.”

vi **See** David Victor, et al., *Geoengineering: Workshop on Unilateral Planetary Scale Geoengineering* (Council on Foreign Relations, May 5, 2008), archived online at:

<http://www.cfr.org/projects/world/geoengineering-workshop-on-unilateral-planetaryscale-geoengineering/pr1364>

**See also** David Victor, et al., *The Geoengineering Option: A Last Resort Against Global Warming* (Foreign Affairs Magazine. Council on Foreign Relations, March/April 2009), archived online at:<http://www.foreignaffairs.com/articles/64829/david-g-victor-mgranger-morgan-jay-apt-johnsteinbruner-and-kat/the-geoengineering-option>

**See also** *Stop Emitting CO2 or Geoengineering Could Be Our Only Hope* (Royal Institute, August 28, 2009), archived online at: <http://royalsociety.org/Stop-emittingCO2-or-geoengineering-could-be-our-only-hope/>

**See also** *Geoengineering the Climate: Science Governance and Uncertainty* (Royal Society, September 1, 2009), archived online at:

<http://royalsociety.org/policy/publications/2009/geoengineering-climate/>

**See also** *Geoengineering – Taking Control of Our Planet’s Climate* (Royal Institute, November 8-9, 2010), archived online at:

<http://royalsociety.org/events/2010/geoengineering/>

**See also** Lee Lane, et al., *Workshop Report on Managing Solar Radiation* (NASA, April 2007), archived online at:

<http://event.arc.nasa.gov/main/home/reports/SolarRadiationCP.pdf>

**See also** Vergano, Dan, *Can Geoengineering Put the Freeze on Global Warming?* (*USA Today*, February 25, 2011), archived online at:

[http://www.usatoday.com/tech/science/environment/2011-02-25geoengineering25\\_CV\\_N.htm](http://www.usatoday.com/tech/science/environment/2011-02-25geoengineering25_CV_N.htm)

**See also** Kunzig, Robert. *Geoengineering: How To Cool Earth—At A Price* *Scientific American*. October 20, 2008), archived online at:

<http://www.scientificamerican.com/article.cfm?id=geoengineering-how-to-cool-earth>

**?See also** Erika Engelhaupt, *Engineering a Cooler Earth: Researchers brainstorm a radical ways to counter climate change* (*Science News*, June 5, 2010, pp 16-20) archived online

at:<http://www.scribd.com/doc/78635966/Engineering-a-Cooler-Earth>

**See also** *The Regulation of Geoengineering* (UK House of Commons Science and Technology Committee, Fifth Report Session 2009-2010), archived online

at:<http://www.publications.parliament.uk/pa/cm200910/cmselect/cmsctech/221/221.pdf>

**See also** *Us House of Representatives and UK Parliament House of Commons Joint Statement on Geoengineering 2010*, archived online

at:<http://www.publications.parliament.uk/pa/cm200910/cmselect/cmsctech/221/22111.htm>

**See also** J. J. Blackstock et al., *Climate Engineering Responses to Climate Emergencies* (Novim, 2009), archived online at:<http://arxiv.org/pdf/0907.5140>

<sup>?vii</sup> **See** *Task Force on Climate Remediation Research* (The Bipartisan Policy Center, October 2011), archived online at:

<http://www.bipartisanpolicy.org/sites/default/files/BPC%20Climate%20Remediation%20Final%20Report.pdf>

**See also** *International Consortium of NGOs Calls for Coordinated Action on Geoengineering Research* (Royal Institute, December 2, 2011), archived online at:

<http://royalsociety.org/news/srmgi-report-2011/>

**See also** Zabarenko, Deborah, *Geo-engineering: A Bad Idea Whose Time Has Come?* (Reuters, December 9, 2011), archived online at:

<http://www.reuters.com/article/2011/12/09/us-climate-geoengineeringidUSTRE7B81Y820111209>

<sup>viii</sup> **See** *What In The World Are They Spraying?* (Truth Media Productions, 2010), archived online at: <http://www.youtube.com/watch?v=jf0khstYDLA>

**See also** *Climate Change 2007: Working Group III: Mitigation of Climate Change*. IPCC Fourth Assessment Report: Climate Change 2007, (Intergovernmental Panel on Climate Change, 2007), archived online at:

[http://www.ipcc.ch/publications\\_and\\_data/ar4/wg3/en/spmsspm-c.html](http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-c.html)

(“Geo-engineering options, such as ocean fertilization to remove CO<sub>2</sub> directly from the atmosphere, or blocking sunlight by bringing material into the upper atmosphere, remain largely speculative and unproven, and with the risk of unknown side-effects.”)

<sup>ix</sup> “19.530.030 -Administrative enforcement. In lieu of, or in addition to, enforcement by criminal prosecution, if the director of public works, the director of environmental management, the director of water supply, or the planning director determines that any persons are violating any provision of titles 8, 12, 14, 16, 18, 19 and 20 of this code, any rules adopted thereunder, or any permit issued thereto, the director may have the person served, by mail or personal delivery, with a notice of violation and order pursuant to this chapter and such administrative rules as the director may adopt.

A. Contents of the notice of violation. The notice shall include at least the following information:

1. Date of the notice;
2. The name and address of the person noticed;
3. The section number of the provision or rule, or the number of the permit which has been violated;
4. The nature of the violation; and
5. The location and time of the violation.

B. Contents of the order.

1. The order may require the person to do any or all of the following:

1. a. Cease and desist from the violation;
2. b. Correct the violation at the person’s own expense before a date specified in the order;

3. c. Pay a civil fine not to exceed \$1,000.00 in the manner, at the place, and before the date specified in the order;
4. d. Pay a civil fine not to exceed \$1,000.00 per day for each day in which the violation persists, in the manner and at the time and place specified in the order; and
5. e. Pay a civil fine not to exceed one percent of the project cost as provided in Section 20.08.260.E.2 of this code.

2. The order shall advise the person that the order shall become final thirty days after the date of its mailing or delivery. The order shall also advise that the director's action may be appealed to the board of variances and appeals.

C. Effects of order; right to appeal. The provisions of the order issued by the director of public works, the director of environmental management, the director of water supply, or the planning director under this section shall become final thirty days after the date of the mailing or delivery of the order. The person may appeal the order to the board of variances and appeals as provided for in this article. However, an appeal to the board of variances and appeals shall not stay any provision of the order.

D. Collection of unpaid civil fines. In addition to any other procedures for the collection of civil fines available to the County by law or rules of the court, the County may add unpaid civil fines as herein defined to any County taxes, fees or charges except for residential water or sewer charges.

E. Judicial enforcement of order. The director of public works, the director of environmental management, the director of water supply, or the planning director may institute a civil action in any court of competent jurisdiction for the enforcement of any order issued pursuant to this section. Where the civil action has been instituted to enforce the civil fine imposed by said order, the director or agency need only show that the notice of violation and order were served, that a civil fine was imposed, the amount of the civil fine imposed, and that the fine imposed has not been appealed in a timely manner nor paid."

#### **IV. Hybrid Electric Vehicles**

##### **HIDDEN COSTS**

##### **AN EVIDENCE-BASED ANALYSIS OF SUSTAINABILITY INITIATIVES**

##### **AND SUBSIDIES FOR ENERGY PRODUCTION**

**White Paper by William Goetz**

##### **GREEN SPEED MAY NOT BE SO GREEN**

Much has been made about reducing greenhouse gas emissions and pollution through the production and use of hybrid and/or electrical vehicles. Many companies and governmental jurisdictions are

rushing to buy such vehicles, and/or to construct charging stations. However, if one considers the life-cycle of carbon emissions, it turns out that H/EVs are more damaging than conventional gas vehicles to the environment and to human health. Please review the chapter on Transportation in a study by the National Academy of Sciences, entitled "The Hidden Costs of Energy," pp. 197+.

[http://www.nap.edu/openbook.php?record\\_id=12794&page=1](http://www.nap.edu/openbook.php?record_id=12794&page=1).

Downloads are free after registering, which is also free. This site is an amazing source of comprehensive, objective, evidence-based analyses of multiple topics of interest to government.

Here is another evidence-based study:

<http://onlinelibrary.wiley.com/store/10.1111/j.1530-9290.2012.00532.x/asset/jiec532.pdf?v=1&t=hz6diqoz&s=87ba2dfefe1c45b379fea08eccd7784b79239686>

Here are two blogs that summarize the above evidence in relatively non-technical terms:

<http://spectrum.ieee.org/energy/renewables/unclean-at-any-speed>

<http://hotair.com/archives/2013/07/03/electric-vehicles-unclean-at-any-speed>

Basically, the problem is that more electrical energy - all of it from fossil fuels - is used in the production of the cars, their special batteries, recharging, and disposal, than for conventional gas powered vehicles. Much of that is related to the need for energy-intensive light materials for the frame and body in order to offset the weight of the battery. The more use of electricity - almost all of it from fossil fuels - the more damage, both from pollution and GHGs. The decrease in operating emissions is more than negated by the emissions created in their manufacture and disposal.

It is predicted that this will not change until most of our electrical energy is derived from a grid mostly powered by renewable energy sources, which will probably not occur until 2030 at the earliest. The NAS authors (over 70 of the foremost engineers, energy experts, and toxicologists in the US) took into account the probability of technological advancements.

A second, subsequent NAS study by a different group of experts reiterated that unless the energy powering the grid changed from fossil fuels to primarily renewable sources, nothing would be gained by subsidizing biofuels, E/HVs, fuel-cell electrical vehicles, or compressed natural gas vehicles ([http://www.nap.edu/catalog.php?record\\_id=18264](http://www.nap.edu/catalog.php?record_id=18264)).

The importance of the sources of energy powering the grid cannot be overemphasized. A recent study of the emissions and health impacts of electric vehicles in China provides a startling example ([http://personal.ce.umn.edu/~marshall/Marshall\\_34.pdf](http://personal.ce.umn.edu/~marshall/Marshall_34.pdf)). In China, 75% of the electricity is derived from coal. Electrical vehicles manufactured from this grid cause pollution that results in three times the excess number of deaths as those caused by petroleum-powered vehicles. In the United States, about

50% of the energy used to produce electricity comes from coal. While a direct comparison cannot be drawn, such statistics are supportive of the studies noted above.

Governments also need to consider the costs, efforts, subsidies, and life-cycle damages from the construction of recharging infrastructure. Building and operating these structures, and the recharging of vehicles consumes fossil-fuel generated electricity, petroleum, and diesel fuels. Recharging stations thus cause further damage to humans and the environment, above that caused by the manufacture, operation, and disposal of the H/EVs themselves. Since the cars themselves are counterproductive to sustainability goals, then it is apparent that the time, effort, and money put into recharging infrastructure adds insult to injury.

Recharging stations could be powered by distributed, onsite solar sources. However, that still does not address the damages from the manufacturing and disposal of the H/EVs, or from the construction of recharging infrastructure. Nor is it likely utility companies would substantially support onsite solar since they would be losing income from decreased (fossil-fuel) electricity usage.

Buyers with good intentions, trying to do right to the environment by purchasing these vehicles, are misled in three ways.

First, the manufacture and disposal of the vehicles is more damaging to the environment and humans than conventional gas-powered vehicles.

Second, the electricity for recharging also comes from fossil fuel production. Utilities love the concept of recharging, since almost all of the electricity would come from their own (fossil-fuel) power plants. Converting from a petroleum-based system to a fossil-fuel electricity-based system would make them billions. Unfortunately, this merely shifts the main fossil-fuel distribution from petroleum towards coal, natural gas, and nuclear sources, none of which are renewable. It would also problem-shift pollution and GHG emissions out of high-density traffic areas, and into other areas of the country.

The above considerations more than negate the decreased emissions from E/HV operations.

Third, the retail cost of the vehicles is at a significant premium to conventional vehicles. Depending on how long a buyer keeps the car, what it is used for, and how many miles it is driven, then the H/EVs may not be cost-effective for many purchasers, including municipalities, over most anticipated lifetimes of the cars. The shorter the operational lifetime and fewer miles driven, the less chance of recouping costs from not using gasoline.

The Congressional Budget Office estimates that a plug-in hybrid costs approximately \$19,000 more to buy over a lifetime of 150,000 miles than does a conventional vehicle ([http://www.cbo.gov/sites/default/files/cbofiles/attachments/09-20-12-ElectricVehicles\\_0.pdf](http://www.cbo.gov/sites/default/files/cbofiles/attachments/09-20-12-ElectricVehicles_0.pdf)). Even adding in rebates, it is likely that only higher income consumers will be able to afford such vehicles well into the future. This may create a form of social inequity, and is not likely to change until after 2030.

The CBO also notes that under current CAFÉ standards through 2021, the more high-fuel economy E/HVs that manufacturers can sell, the more low-fuel economy vehicles they can sell, and still meet the standards.

In addition, while increasing vehicle fuel efficiency decreases the cost of driving a mile, this may result in people driving more miles as it becomes less costly. Thus, a substantial portion of the gains from emission standards is negated. This is called the rebound phenomena, which reduces the real-life benefits of most efficiency efforts by 10-30% or more. A review of the renewable energy literature indicates that the rebound phenomenon is almost never taken into account when reviewing savings from sustainability initiatives. In that regard, the largest portion of determinations of savings from sustainability efforts is pre-intervention estimates rather than actual post-intervention measurements of real-life savings.

The bottom line is that the federal government will spend more than \$7.5B through 2019 on subsidizing E/HVs, with little or no not effect on gas consumption or greenhouse gas emissions. The cost to the government of these subsidies is \$2 to \$10 per gallon of gasoline avoided.

A similar reduction in carbon and GHG emissions would occur at no cost to governments if federal, state, and local governments increased taxes on gasoline by 30-50 cents per gallon. There would be an immediate effect on fuel use and GHGs as consumers drive less in the cars they already own. In addition, there would be no offsetting CAFÉ effect. Revenues from these taxes could be used to mitigate any regressive effects by setting a price floor for reductions in other taxes, and by providing other subsidies to the lower income and rural demographic.

The second NAS study also finds that, "Several types of policies including a price floor for petroleum-based fuels or taxes on petroleum-based fuels could create a price signal against petroleum demand, assure producers and distributors that there is a profitable market for alternative fuels, and encourage consumers to reduce their use of petroleum fuels. High fuel prices, whether due to market dynamics your taxes, are effective in reducing fuel loss...The commercialization of fuel and vehicle technologies is best left to the private sector in response to performance-based policies, or policies the target reductions in GHG emissions or petroleum use rather than specific technologies."

The study also suggests that, "...an expert review process independent of the agencies implementing the deployment policies and also independent of any political or economic interest groups advocating for the technologies being evaluated be used to assess available data, and predictions of cost and performance....Research is needed to better understand key factors for transitions to new vehicle fuel systems such as the cost of limited fuel availability, disutility of vehicles with short ranges and long recharge times, the numbers of innovators and early adopters among the car buying public, as well as a willingness to pay for novel technologies and the risk aversion of the majority, and much more."

The current administration would serve itself well by heeding this advice. It is so politically invested in subsidizing E/HVs that it should doubt its own internal reports on their cost-effectiveness. As the NAS explains, "Policy should be designed to be adaptable so the midcourse corrections can be made as knowledge is gained about the progress of vehicle and fuel technologies. Further, it is essential the

policies be designed so they can be adapted to changing evidence about technology and market acceptance, and market conditions." That is, in deciding policy, the administration should rely primarily on the objective, evidence-based, high impact, peer-reviewed energy literature, and on non-partisan groups such as the NAS and CBO.

As noted in one of the blogs, comparing E/HVs to petroleum-fueled conventional vehicles sets a very low bar. We should not let such comparisons distract from seeking more effective, evidence-based ways to reduce pollution and GHGs – smog reduction, electric bikes, public transportation, energy and gasoline taxes, carbon cap-and-trade, and land-use changes, to name a few.

This brings to mind the well-known, ill-advised rush/fiasco to subsidize ethanol production from corn. Failure to remove such subsidies is an example of the failure of the free market and of the political process that is supposed to support it.

Despite good intentions, there are unanticipated and unintended consequences to subsidizing E/HVs that only become evident on an objective, evidence-based analysis. Without first changing the primary source of energy to the grid from fossil fuels to renewable sources, we will end up subsidizing the production of pollution and GHG emissions rather than reducing them. Local governments should consider this when deciding whether to invest in H/EVs and recharging infrastructure.

Sustainability initiatives compete with all other government initiatives for scarce money and resources. We cannot afford to put our efforts into projects that are not proven, let alone those that are counterproductive. We would be better off at this time by putting our limited financial resources into evidenced-based, more cost-effective methods for reducing GHGs and pollution.

When faced with a problem, there is a tendency to rush to do something – anything – before performing a proper, evidence-based analysis. Sometimes, a better choice would be: don't just do something, stand there.

## **THERE IS NO SUCH THING AS CLEAN ENERGY**

Utilities are claiming that natural gas plants produce relatively clean energy compared to other fossil-fuel electricity producing plants such as coal-fired facilities. Some are promoting this as a bridge until renewable energy sources become the norm. Unfortunately, over a period of 20 years, natural gas plants create more global warming than coal-fired plants. Please see: <http://www.stanford.edu/group/efmh/jacobson/Articles/I/NewYorkWWSEnPolicy.pdf>. This fascinating but well-documented and evidence-based article also discusses how to immediately convert a state's energy supply away from fossil fuels and towards renewable sources.

The summary explanation here is somewhat of an oversimplification, but should suffice to elicit comments.

The coal plants produce high quantities of sulfur dioxide, which block global warming by reflecting sunlight. On the other hand, natural gas plants produce high levels of methane, which has a much higher greenhouse gas warming effect per weight than carbon dioxide. Methane has a global warming potential that is 72–105 times greater than carbon dioxide over an integrated 20-year period after emission and 25–33 times greater over a century period.

In addition, life-cycle emissions from natural gas extraction by fracking, and then its subsequent transportation and refining, releases higher quantities of carbon dioxide and methane, as well as releasing other toxins into the environment.

Over a period of time, the methane and other toxic emissions more than cancel out the decreased carbon emissions from natural gas plants relative to coal-fired plants.

"Thus, natural gas is not a near-term “low” greenhouse-gas alternative, in absolute terms or relative to coal. Moreover, it does not provide a unique or special path to renewable energy, and as a result, it is not bridge fuel and is not a useful component of a sustainable energy plan."

Sometimes you don't get what you pay for. Sometimes you get more of what you're paying for to get less.

## **SUBSIDIES AND EXTERNALITIES**

Energy production from fossil fuels is estimated to cause at least 30,000 excess deaths per year in the US from pollution. More US citizens die every year from this pollution than the cumulative deaths from all the years of our recent wars. It causes an at least an estimated 400,000 deaths worldwide every year.

On top of this, its global warming costs are estimated to be in the range of trillions of dollars.

Such hidden costs, also known as externalities, disrupt the economic, political, geologic, biologic, geographic, and social equilibrium of governments and citizens. These costs thus upset global, transnational, national, homeland, and individual security (Homeland Security Affairs Journal, <https://www.hsaj.org/?article=9.1.6>).

The National Academy of Sciences estimates the hidden health costs of pollution from fossil fuels in the US to be in excess of \$130B per year. The environmental costs add billions more ("The Hidden Costs of Energy." [http://www.nap.edu/openbook.php?record\\_id=12794&page=1](http://www.nap.edu/openbook.php?record_id=12794&page=1)).

Recent estimates by the EPA of health damages from fossil fuel electricity are on the order of \$365-886B/year, representing 2.5-6.0% of the national GDP. For coal and oil, these costs are larger than the typical retail price of electricity (<http://www.sciencedirect.com/science/article/pii/S0160412012000542>; full report available on request).

It should be noted that the hidden financial costs of a grid crash are also immense, yet are not acknowledged by most utilities. The Department of Homeland Security has determined that because

electrical outages essentially turn off the economy, then \$135 is lost to the economy for every single man, woman, and child who is without power for a 24-hour period (<http://www.usc.edu/dept/create/assets/001/50773.pdf>).

To put this in perspective, as an example, the loss to the economy of Fort Lauderdale is \$23M for every day the City is without power. This figure does not include monetary damages from temporary outages of even a few seconds that cause losses to businesses of computerized data, and which require rebooting of systems, all at considerable cost in time, effort, and money. Nor does it include damages to grid infrastructure.

The cost-effectiveness of investment in grid-independent renewable resources, such as distributed solar, wind, and microgrids to obviate such losses seems obvious. FPL, a monopoly and the largest utility in Florida, continues to lobby against renewable portfolio standards, distributed solar and wind incentives, and net metering. It recently shut down a solar water-heating program. Nonetheless, FPL is guaranteed a 10-11% return on equity.

Despite all of this, when externalities are included, the US subsidizes fossil fuel energy producers to the tune of more than \$500 Billion per year - \$500,000,000,000 (note the number of zeroes). This is likely an underestimate. Globally, the subsidies account for \$2.4 Trillion annually (\$2,400,000,000,000), or about 3% of the world's GDP, and 8% of global government revenues (International Monetary Fund, <https://www.imf.org/external/np/pp/eng/2013/012813.pdf>).

The same free-market advocates who vehemently decry renewable energy subsidies as an anathema to "free-market" principles vigorously support the fossil-fuel subsidies noted above. Yet, in total, these current fossil-fuel subsidies make any proposed renewable energy subsidies look like pocket-change.

Because these subsidies and externalities (the aforementioned hidden health and environmental costs) are not reflected in the price of gasoline at the pump, or in electricity at the socket, this is a textbook example of the failure of free markets to set prices

([http://www.themodestproposal.com/?page\\_id=131](http://www.themodestproposal.com/?page_id=131) - every politician and government manager should read this short essay).

FPL's monopoly status and its guarantee of a 10-11% ROI represents another example of not allowing the free market to set prices, thus further reducing its efficiency.

Allowing the market to set the cost of gasoline and electricity would inevitably raise the cost per gallon and kilowatt substantially. The IMF and others have suggested ways to limit the impact of such rising prices. The bottom line is that this would put pressure on governments and companies to find less costly alternatives, such as renewable energy sources and mass transit. Done in a reasoned manner (see IMF monograph for strategies), overall transportation and electricity costs would equilibrate at lower absolute levels, and cause less harm to humans and the environment.

To counter subsidies and to move closer to a free-market economy, federal, state, and local governments could increase taxes on gasoline by 30-50 cents per gallon. The Congressional Budget Office calculates that the result would be carbon and GHG emissions reductions that are equivalent to that from all subsidies to E/HVs ([http://www.cbo.gov/sites/default/files/cbofiles/attachments/09-20-12-ElectricVehicles\\_0.pdf](http://www.cbo.gov/sites/default/files/cbofiles/attachments/09-20-12-ElectricVehicles_0.pdf)). There would be an immediate effect on fuel use and GHGs as consumers drive less in the cars they already own. In addition, there would be no offsetting CAFÉ effect. Revenues from these taxes could be used to mitigate any regressive effects by setting a price floor for reductions in other taxes, and by providing other subsidies to the lower income and rural demographic.

Another example of forcing the fossil fuel energy sector to bear the costs of its own externalities is to tax carbon at the source. Cap-and-trade is the prototype. This would immediately improve the free market in energy.

However, we might also consider actually taking away fossil fuel “entitlement” subsidies. It would assuredly decrease jobs in the fossil fuel sectors. However, since every dollar into the renewable energy sector creates more jobs than money added to the current fossil fuel sectors, more jobs would be created, with a net increase in GDP.

If we transferred only a portion of the eliminated “entitlements” from fossil fuel producers to the Department of Defense, we could refund our military. If we transferred another portion to the Department of Health and to the states, we could recoup any unanticipated costs of Obamacare “entitlements,” which are so decried by free market advocates.

Fossil fuel subsidies might have been appropriate at one time. However, we can now generate power cleanly. Allowing the fossil-fuel energy sector to get a free ride on their externalities inhibits renewable energy deployment and makes the free market less efficient.

Fossil fuel “entitlements,” along with their consequent negative effects of global warming, represent the most costly failure of the free market in human history.

The elimination of these fossil fuel “entitlements” would save countless lives, now and in the future.

How many lives does your gallon of gasoline cost?

How deadly is your kilowatt? (<http://www.forbes.com/sites/jamesconca/2012/06/10/energys-deathprint-a-price-always-paid/>)

What good is cheaper, subsidized energy if it kills us?

## **V. Florida Friendly Landscape Ordinance**

<http://www.fortlauderdale.gov/news/2014/101414florida-friendly.htm>

## **Summary of Proposed Ordinance Amendments**

### **to Incorporate Florida-Friendly Landscaping™ Principles**

The proposed Florida-Friendly Landscaping™ ordinance includes revisions and criteria which encourages nationally-recognized Florida-Friendly landscape (FFL) principles as language to be incorporated into the City of Fort Lauderdale Code of Ordinances, Chapter 47 Unified Land Development Regulations (ULDR), ARTICLE III. - DEVELOPMENT REQUIREMENTS Section 47-21. LANDSCAPE AND TREE PRESERVATION REQUIREMENTS.

By increasing the amount of trees and plants which are adapted to the local climate, the resilience of landscaping citywide will be improved and the amount of irrigation water required to maintain healthy landscapes will be reduced.

**Included within this proposed language are revisions that reflect the following main points:**

**Updated terminology to be current with Florida-Friendly Landscaping™ principles and landscape industry standards, and improved irrigation practices.**

- ☐ Deleted outdated references which were replaced with more current, industry terminology commonly used in practice today.
- ☐ Replaced the outdated term “xeriscaping” with “Florida-Friendly Landscaping™”.
- ☐ Replaced where applicable, the measurement term “diameter” with “caliper”.
- ☐ Deleted the term “at breast height” and replaced with “caliper”. Landscape industry professionals such as suppliers and designers refer to “caliper” which is typically measured at purchase.
- ☐ Created an irrigation section to provide guidance on planning and installation of more efficient systems.

Page 2 of 2

**Improved alignment with existing Florida Department of Environmental Protection and Broward County criteria.**

- ☐ Referenced Broward County ordinance<sup>1</sup> as the basis for revisions (Volume II, Chapter 39 Zoning, Article VIII. Landscaping for Protection of Water Quality and Quantity).
- ☐ Referenced species and terms identified within the Florida-friendly Plant Database<sup>2</sup> as developed by the Florida Springs Initiative of the Florida Department of Environmental Protection.
- ☐ Allowed for more consistency for property owners and developers to understand ordinances used throughout cities within Broward County.

1 [www.municode.com/library/#!/fl/broward\\_county/codes/code\\_of\\_ordinances](http://www.municode.com/library/#!/fl/broward_county/codes/code_of_ordinances)

2 [www.floridayards.org](http://www.floridayards.org)

\* Public meeting for review and comment

**Upgraded criteria to reflect standards that further support sustainability principles and preservation of the tree canopy.**

☐ Clarified statement of intent and definitions to be purposeful and focused toward sustainability.

☐ Increased the total amount of FFL required per property from 40% FFL of total landscape required to 50% FFL.

☐ Reduced the tree size threshold for requiring a City permit for tree removal. Revised from a caliper of equal to or greater than twelve (12) inches, to be equal to or greater than eight (8) inches at true caliper.

**Next Steps and Tentative Timeline**

**Revised Ordinance Amendments Review and Approval**

Public review and comment on proposed Ordinance Revisions to

Incorporate Florida-Friendly Landscaping™ principles into the

ULDR Section 47-21. LANDSCAPE AND TREE PRESERVATION REQUIREMENTS

**OCTOBER \*Open House** *Tuesday, October 14, 2014, 5:00 PM*

**\*Council of Fort Lauderdale Civic Associations,** *Tuesday, October 14, 2014, 7:00 PM*

**\*Sustainability Advisory Board (SAB),** *Wednesday, October 27, 2014, 6:30 PM*

**NOVEMBER \*Planning and Zoning Board Meeting** *Wednesday, November 19, 2014, 6:30 PM*

Planning Zoning Board review and recommendation to the City Commission.

**DECEMBER \*City Commission Regular Meeting:** Public Hearing (Reading 1)

**JANUARY \*City Commission Regular Meeting:** Final Adoption Hearing (Reading 2)

**VII. FPL Community Solar**

[http://www.nytimes.com/2014/10/23/business/solar-energy-discounts-become-employee-perk-in-new-program.html?ref=energy-environment&\\_r=0](http://www.nytimes.com/2014/10/23/business/solar-energy-discounts-become-employee-perk-in-new-program.html?ref=energy-environment&_r=0)

**Dr. Goetz – Suggestions for discussion FPL Community Solar Project:**

It is recognized that the City has already put a lot of time and effort into the FPL proposal. That said, many of us still have questions about the appropriateness of the proposal as presented, and would encourage the City to consider alternatives.

I would like the board to briefly consider the following comments during the discussion of the FPL Community Solar Project under Old Business. The first five alternatives, and the sixth proposal, were previously distributed as part of my position paper on the subject. The references in the comments are to information distributed in information exchanges around the same time as the position paper. I would particularly suggest consideration of point 4, below, to invite Siemens to give a presentation.

I would also encourage everyone to send Tyler additional suggestions for alternative solar projects. If they are submitted before the meeting, they could be distributed at the meeting for our consideration at a future meeting.

I would also propose brief consideration under New Business of point 6, as a subject for future discussion.

I would suggest five possible alternatives:

- 1.** One alternative is to work with other energy companies and community organizations to negotiate distributed renewable energy installations on a community-wide basis to take advantage of the economies of scale, and of group negotiation influence. Several successful models have been implemented. See recent info exchange.
- 2.** A second alternative is to mimic successful projects from other municipalities. See covering email attachment with links to the DOE referencing resources and successfully implemented projects.
- 3.** Another alternative is to invest in microgrids.

Microgrids are independent, small-scale electricity systems for communities, towns, campuses, government buildings, and even individuals, delivering integrated distributed renewable energy, improved grid reliability, personal energy use data and customized control, and which can function independently of the grid during disasters. See attached.

As noted above, it has been previously suggested that city firehouses and other critical government buildings and infrastructure might benefit from such an arrangement.

**4.** Berkeley Labs has developed a tool (see attachment in covering email) to help maximize economic benefit from such systems, that answers the following:

- a.** Which is the cost-optimal configuration of distributed generation technologies that a specific customer can install?
- b.** What is the appropriate level of installed capacity of these technologies that minimizes cost?
- c.** How should the installed capacity be operated to minimize the total customer energy bill?

The City should consider using this or a similar objective methodology to evaluate and prioritize among proposed initiatives.

5. City ESCOs might be of assistance in designing, installing, and operating renewable energy systems for government buildings, including microgrids and solar.

For instance, Siemens has developed control systems for microgrids. See covering email attachment "Business Case..."

I would suggest bringing Siemens in for a presentation to staff and the SAB, on both microgrids and on other cost-effective alternatives to the FPL plan. I am sure that, like FPL, they would see it within their self-interest to make such a presentation without charging the City.

No need to reinvent the wheel.

Nor to assume that FPL will offer the most appropriate and cost-effective solution out of the goodness of their heart.

#### **VIII. Food Forest Communication**

*Food Forest Proposal*

*Submitted by:*

*Sustainability Advisory Board Member*

*Cheryl Whitfield*

*October 23, 2014*

#### **DRAFT**

**Sustainability Advisory Board, Oct 27, 2014**

**Food Forest Proposal Item**

That the Ft Laud City Commission approve an RFQ that stipulates the following:

- That Food System Planners compose the RFQ to create an economic and environmental self-sustaining project;
- That the RFQ author must be actively engaged in the profession of Food System Planning and production and have achieved substantial experience in the field;
- That the prototype of project be self-sustaining, not dependent upon grant funding for operational support;

- That the White Paper produced be afforded a consultant budget of \$14,000.00 and not subject to the Competitive Negotiation Act;
- The White Paper shall delineate project details, to include, but not limited to:
  - o Data on cost and production
  - o Management and operation
  - o Budget and scope
  - o That a specified % of vegetation shall be edible
  - o Pest and nutrient Management
  - o Installation and Administration of a test Project of limited scope
  - o Compatibility with the City Landscape Ordinance
  - o Discussion of inclusion into public parkland, open space, recreation and tourism

**Potential Discussion Items/Presentations and New Business for Future Meetings**

**Obstructing Sidewalks with Parking Spaces**

Hi Nancy, I would like board members input on this at the next meeting, can you share. The city building department issued a permit for the owner of this apartment building to install 3 parking spaces. The only thing is you cannot park a car without using the sidewalk. There are two full size pickup trucks that use the space in the foreground and one smaller pickup in the single space that you see now. I spoke to Mohammed from the city and he informed me that the only parking space size requirement is on new construction. The parking space where the smaller truck is parked in this photo is larger than the two in the foreground. Thanks, Steve



### **SAB Priority Setting**

Criterion

**Geographic Expansion**

Product readiness

- Organizational readiness
- Supports target customer segments
- Product fit
- Distribution and service fit
- Transforms competitive positioning**
  - Defensible IP position
  - Differentiation in product
- Improves technology readiness**
- Environmental sustainability**
- Social sustainability**
  - Improves employee perception
  - Improves external stakeholder perception
- Supports restructuring**
  - Operational readiness
  - Human factors
  - Disaster recovery
- Supports human capital development**
  - Recruit the best people
  - Develop the best people
  - Retain the best people
- Supports brand position**
  - Enhances brand value / image
  - Enhances brand reach
- Supports diversity**
- Supports major (government) policy goals (endless list of possibilities)**
  - Reduces unemployment
  - Makes it easier to do business
  - Reduces homelessness
- Support change initiative**
- Risk**
  - Complexity
  - Level of technology
  - Accuracy of cost estimates
  - Level of project maturity
  - Management capacity
  - Risk of NOT doing this project
- Business resilience**
  - Supports disaster recovery
  - Spreads customer / market risk
  - Spreads financing risk
  - Supports succession planning
- Increase sales**
  - Increase customer acquisition
  - Reduce customer churn
  - Increase value of each customer
  - Increases brand awareness

- Helps us build distribution capacity
- Supports higher pricing for our product/service
- Improves customer satisfaction
- Opens up new markets

**Reduces costs**

- Reduces waste
- Reduces cycle time
- Reduces down-time
- Reduces taxes
- Reduces transport costs
- Reduces warehousing costs
- Reduces energy consumption
- Reduces headcount

**Improve Quality**

- Improve product "feel"
- Reduce warranty claims
- Reduce rework
- Increase mean-time to failure
- Improves employee participation

**Customer satisfaction**

- Improves consistency
- Improves customer journey
- Improves quality of touch-points
- Reduces number of complaints
- Improves (INSERT YOUR MOST COMMON CUSTOMER GRIPE)

**Improves employee productivity**

- Gives people access to information they need
- Empowers people to take ownership
- Supports skills development
- Improves staff motivation

**Financial**

- Net Present Value (NPV)
- Return on Investment (RoI)
- Internal Rate of Return (IRR)

**EVALUATION AND PRIORITIZATION**

**EXAMPLE OF TWO-TIERED MATRIX COMPONENTS**

**First Tier - Evaluation criteria (for individual initiatives); in addition to or replacing above criteria**

Access  
Community support/resistance  
Consistency with long-term plans  
Convenience  
Cost-effectiveness  
Economic impact  
Effectiveness  
Efficiency  
Energy efficiency  
Financing options  
Funding availability  
Impact on operating budget  
Improve public health  
Improve public safety  
Infrastructure support  
Increase efficiencies  
Legal mandate  
Levels of service: improve, maintain, decrease  
Life-cycle cost  
Life-cycle damages  
Linkages to other projects  
Net present value  
Outcome-oriented  
Political implications  
Political relevance  
Priority within functional area  
Recycling potential  
Reduce GHGs/pollution  
Research/pilot study  
Return on investment  
Quality of supporting evidence  
Service addition  
Social equity (who benefits)  
Strength of recommendation  
Sustainability (intergenerational equity)  
Timing  
Urgency of need  
Upfront costs

**Second Tier - Prioritization criteria (between initiatives)**

Consequence/probability analysis  
Consistent with Commission goals/objectives  
Cost-effectiveness compared to other initiatives

Equity (who benefits; current and intergenerational)  
Favorable cost-benefit ratio  
Funding availability  
Improve public safety  
Increase economic development  
Legal mandate  
Measurable outcomes  
Net present value  
Return on investment

**Notes:**

Besides rating on each criterion, each criterion can be weighted  
(rating x weight = score)

Each initiative is first evaluated on its own merits; then all initiatives are compared to each other and prioritized

Benefit metrics	Relative weight	Feasibility metrics	Relative weight
Customer Service/Satisfaction	3	Ease of Implementation	3
Stabilize/Reduce Operating Costs	2	Likelihood of Success	2
Increase Effectiveness	2	No Legal/Regulatory Constraints	2
Protect/Enhance Environment	1	Low Cost to Implement	1
Value Employees	1	Low Political Repercussions	1

**Global BEM Conference**

<http://globalbem.com/conference/>

**Trolley Emissions**



